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# The Soul's Speaker: Give your eyes some rest

Fuye Zhang

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Master of Fine Arts  
Visual Communication Design  
School of Design  
College of Imaging Arts and Sciences  
Rochester Institute of Technology

# **The Soul's Speaker**

## **Give your eyes some rest**

**Fuye Zhang**  
MFA Candidate

Visual Communication Design MFA Program  
School of Design  
College of Imaging Arts & Sciences  
Rochester Institute of Technology  
Approved on December, 2017

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# Thesis Committee Approval

Rochester Institute of Technology  
College of Imaging Arts and Sciences  
School of Design  
MFA Visual Communication Design

**Project** The Soul’s Speaker – Give Your Eyes Some Rest

**Submitted by** Fuye Zhang

**Thesis Committee Approval**

**Chief Thesis Adviser** Daniel DeLuna, School of Design

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Signature of Chief Thesis Adviser                      Date

**Associate Thesis Adviser** Shaun Foster, School of Design

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Signature of Associate Thesis Adviser                      Date

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# Thesis Committee Approval

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1	Abstract
2	Problem Statement
4	Survey of Literature

---

9	Design Process
	Thesis Parameter
	Thesis Concept
	Researches of the Eyes
	Fonts
	Color Palette
	Mind Map
	Story Script
	Storyboard
	Design of Visual Elements
	Ground Design
	Objects Design
	Texture Design
	Z-depth Design
	Animation Design
	Particles Design
	Final Adjust in After Effects

---

39	Conclusion
----	------------

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40	Thesis Proposal
69	Bibliography

# Abstract

College students often fix their eyes on books, on computer screens and archives for a long period of time to gain knowledge. This often affects their eyeballs which usually beams the color red.[1] Research has shown that college students lack the awareness of the benefits of giving their eyes some rest. However, there are a few eye protection advertisements which suggest the need for students to give their eyes some rest. As a designer, the author needs to let people know the important roles that the eyes play in the human body. It is important for designers to produce work that deals with social problems.

The Soul's Speaker is a low-poly 3d promotional animation which seeks to raise awareness on the importance of giving the eyes some rest.

In animation, the author designed the eyeballs as a construction of an abstract light-based system. The environmental design of the animation is based on every part of the eyes' construction. Through this construction and interpretation of environmental destruction, the author hopes to enlighten the people on the dangers of using the eyes excessively.

**Keywords**

Visual Communication Design  
Design  
Human Needs  
Health  
Eyes  
Promotion Animation

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[1] Aimee Surtenich, Red Eyes, Bloodshot Eyes, <http://www.allaboutvision.com/conditions/red-eyes.htm>

# Problem Statement

Once an artist wants to draw a portrait, they will spend most of their time drawing the eyes, because the eyes can be used to express their mood without speaking any language. The eyes are important organs of the human body. They communicate a lot. Although innocence garnishes the human eyes during their childhood, it becomes vicious as they get old. In social psychology study, the eyes are the windows to people's soul in which moods are expressed.

## Myopia

According to research published in the Pharmaceutical intervention for myopia control, myopia is caused by different reasons which include the internal and external factors.

Myopia results from a mismatch between the eye's optical power and its axial length. The precise nature of the structural changes in the posterior chamber that leads to myopia seems to vary and may be the result of the stretch which is limited to the equatorial region, global expansion of the vitreous chamber, posterior pole elongation or some combination of these factors.[2]

The external reason is the environmental factor, when young people are reading or working together in close distance, the rectus Medialis which is the part of the extrinsic part of the eyeball muscle will put some pressure on the eyes, and the pressure inside the eyes will become stronger. If the extrinsic eyeball muscle and Ciliary muscle are in the stress state for a long time, it will cause the Ciliary muscle spasm, which would result in vision loss.[3]

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[2] Ganesan, Prema, and Christine F. Wildsoet. "Pharmaceutical intervention for myopia control." *Expert review of ophthalmology* 5, no. 6 (2010): 759-787

[3] Muscles of the eyes, <http://www.musclesused.com/muscles-eyes/>

In this project the main target is to focus on the external factor, which is the environmental factor. So it is necessary to make a 3D promotion animation, to let people know the important roles that the eyes play in the human body, eyes' complex construction, and help people raise the awareness to protect the eyes. It is the responsibility for the designer to promote the social public problems.

This thesis proposes a study that explores how designing a 3D promotional animation can help to raise awareness on the importance of giving the human eyes some rest. The research includes education design, illustration design, 3D animation design, low-poly 3D modeling design and eyes construction information design as related to students, aiming to answer the following questions:

- Selected Key Questions**
- How do the eyes' nerves and muscles change when the eyes become myopic?
  - How much damage can the eyes take when students use it excessively?
  - What are the social and ethical responsibilities of a designer?
  - How can a designer motivate a change of perception through computer graphics design?
  - How can a designer motivate change through 3D animation design?

# Survey of Literature

## Design Info

### **Design: Models of Change**

*by Ken Baynes*

This book tells us that design should provide a favorable environment for the evolution of human society. It must be positive for human society to improve. And it needs to identify a malignant role played by design in the environmental, social and economic crises all over the world.

### **Computer Visualization for the Theatre : 3D Modelling for Designers**

*by Christine A. White, Gavin Carver*

This book tells us that 3D modeling can express the thought of the designer to the viewers in different ways. The book introduces the technology of computer visualization providing many real samples applicable to all software. It can use different ways of techniques utilized in the wider design considerations of performance projects.

### **Numerical Methods: Design, Analysis, and Computer Implementation of Algorithms**

*by Anne Greenbaum, Timothy P. Chartier*

The book tells us that there can be many methods to emphasize different aspects such as design, analysis, or computer implementation on the background. So it gives the feeling that one can do various aspects of expressing the eyes 3D promotion animation. The good thing about this is that the materials can be found online which the author can learn the details from them to improve the thesis.



# Survey of Literature

## Design Info

### **LIMBO**

*Developed by Playdead and Double Eleven  
Microsoft Studios, Playdead. 2010.*

LIMBO is a puzzle video game. The player can use the player like a boy going through dangerous environments looking for his missing sister. The developer built the game's puzzles which are expecting the player to fail a lot of times before eventually finding the correct solution.

This game uses black-and-white tones, lighting, film grain effects and minimal ambient sounds to create an eerie atmosphere associated with the horror genre.

### **Amelia and Terror of the Night**

*Developed by OhNoo Studio  
CreateSpace Independent Publishing Platform. 2012.*

Amelia and Terror of the Night is an interesting interactive story book app not only for children but the young students alike.

The interesting part of this app design is not only in its artistic style but also in its unique 3D effect and animations. The design of the character little girl Amelia and her three animal friends are very good inspiration to the thesis.

# Survey of Literature

## Eyes Info

### **A Simple Guide to Myopia and Refractive Eye Diseases**

*by Kenneth Kee*

This book tells us of one eye disease named Refractive Eye Disease and can cause the error in the focusing of light by the eye. It tells the reason that how to have the poorer eye vision.

### **Improve Your Eyesight: A Guide to the Bates Method for Better Eyesight Without Glasses**

*by Jonathan Barnes*

This book preaches that wearing glasses is not the only way to improve the eyesight. The author recommends the person who has poor eye vision to let the eyes restore the sight by them with relax and give enough rest of the nerves of the eyes.

### **Myopia**

*by Jeff Gardiner*

This novel is about the man with short-sightedness. But he doesn't get defeated by myopia. He finds the world beautiful and exciting in the other way of using his myopia eyes. It suggests that low poly is a good way to do the thesis. Realistic is not the best way to see the way sometimes.

# Survey of Literature

## Eyes Info

### **A biometric investigation of late onset myopic eyes** *by Acta Ophthalmol*

This book is telling us one form of the eyes diseases, which is named onset myopia in about 15-years-old young students who were both age and sex matched. The investigation find the ultimate cause of late onset myopia. It gives us another way to present the world in the eyes which have the eyes diseases.

### **Steady-state accommodation and ocular biometry in late-onset myopia** *by JDoc Ophthalmol*

This book is also telling us the form of the eyes diseases the author mentioned above, which is named onset myopia in about 15-years-old young students who were both age and sex matched. But this book is more focusing on the reason and has more data and graphics compared to the formal one. the author can know the precise details of the construction of the onset myopia.

# Survey of Literature

## Internet Recourses

### **Earth Day “Rethink Butts”**

*<http://vimeo.com/63347105>*

The “Rethink Butts” campaign is a creative 3d promotion animation, which sparks discussions and encourages the general public to think about tobacco trash in a new way. The rethink of the tobacco and the rendering of the scene is film level. The method that shows the secrets of the story, in the end, can make people exciting.

### **OMEGA Co-Axial Chronometer - The perfect mechanical movement**

*<http://www.youtube.com/watch?v=ctj-RDbTBMU>*

The rethink of the watch looks very exciting. After watching this 3d advertisement, the author feels that the realistic is not the only way to represent the construction of the watch. We can use the imagination and make the watch out of precise forms to emphasize the real details of the watches’ construction.

# Process

## Thesis Parameter

Presentation	Low-Poly 3D Animation
Duration	90s
Format	1280 x 720

## Concept

***The Soul's Speaker*** is a 3D promotional animation, mainly using the 3d software Cinema-4D. The purpose of the design is to use the description of the in-eyes world environment built using 3d low-poly modeling to ***raise awareness of the beautiful scenes that our eyes can see and the harmfulness of staring at things for a long time with the eyes.*** This is to let people especially students who often focus on their studies with much pressure to know how important it is for them to give their eyes some rest.

The developmental process includes following stages: studying and analyzing the recourses of the construction of eyes, and learning how the eyes get damage when people stare at objects for a long time; brainstorming visual design for low-poly objects and low-poly 3d environmental design; creating story scripts and drawing storyboards; making 3d model, texture; Sound EFX and EFX; evaluating and modifying the design to improve the promotional animation. The elements of design includes character design and background layouts to create the in- eyes world using abstract methods. Also, add the vocal explanation in the background to read the script, so that it is much easier for the viewer to understand the content.

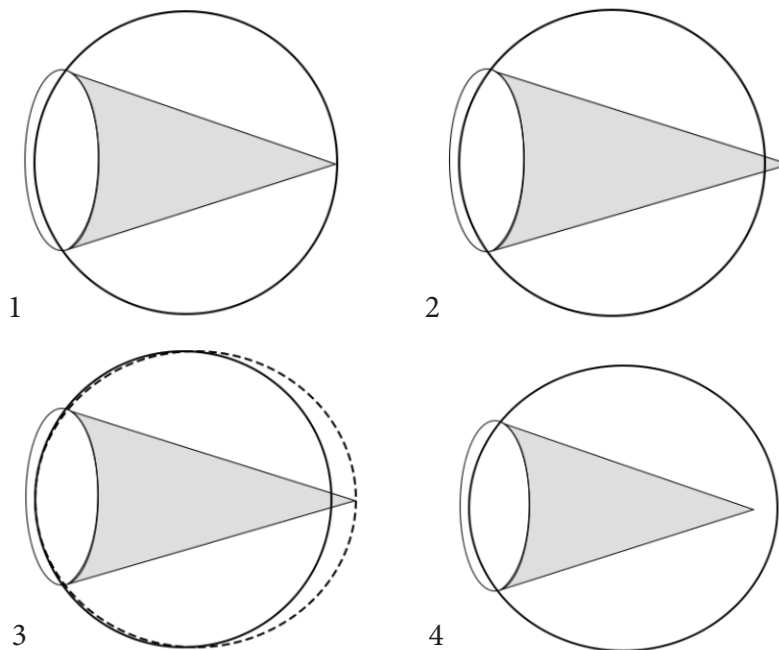
The Software utilized for the thesis consist of Adobe Acrobat Professional, After Effects, Audition, Illustrator, InDesign, Photoshop, AutoDesk Maya, AutoDeskMudbox and Cinema 4D.

The social public animation will be staged in 90s. the author will use C4D to build the world model, the landscapes models, the objects and the creatures- low-poly modeling inside the eyes. The author will use Maya and the particular effects in After Effects to finish the particle part, also, use Audition to make the Sound EFX and reading script edition.

## Researches of the Eyes

In order to let the users understand the principle of why the eyeballs would lose vision, the author made this simple sketches to show the processes involved when eyes loses its function.

- 1 The eyes are watching the distant objects.
- 2 The eyes start to watch the close objects, the light's focus point is behind the wall of the retina.
- 3 The extrinsic muscle and ciliary muscle become stressed, and stretches the wall of the retina to fit the focus point of the light.
- 4 The wall can't return to the original state due to the ciliary muscle spasms that result from staring at the same objects in close distance for a long time.



**Conclusion  
of the Research**

According to research conducted about the construction of the eye, the background of animation is built around the round shape. This causes objects to appear slowly from nothing because light is taken in gradually as we open our eyes.

As **the Soul's Speaker** is a low poly animation, every scene that we see from the reality will be presented as low-poly objects, and even the nerves of the eyeballs would transform into the chains. All of the objects are based on the construction of the human eyes.

**Design Inspiration/  
Personal Style**

After getting inspiration from existing promotional advertisements that already use the combination of low-poly 3d modeling and visual EFX, various ideas for eye protection animation were formulated.

The visual style is low-poly 3d modeling and game design. It will need some of EFX created by After Effects, and to be rendered in Cinema 4D.

Also, lighting and optical EFX is another direction that needs to be considered because it can make a nice variation between the cycles of day and night. It is a good choice for combining the EFX lightning and 3d environment.

## Fonts

As it is a promotional advertisement, the fonts used in the thesis should be formal and rigorous. So it is not appropriate to choose any hand drawing types of font, the typography of the font that the animation needs should be sans-serif like Helvetica and Arial

There are several fonts that the author chose below:

Eras Light ITC

EYES

DINPro Regular

EYES

Reef Bold

EYES

Thin Regular

EYES

In the end, Eras Light ITC is the best choice. It is simple, a little formal and easy to understand. It gives people a feeling that eyes can provide us with power no matter what their size is.

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## Color Palette

The subject matter of the thesis is that people often get tired when they stare at something for a long time, and the nerves of eyeballs will become inflamed and turn red due to this stress. Therefore, there are two main kinds of color palettes.

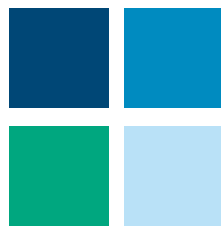
Before the eyes get tired, the nerves of eyeballs are relaxed, adapting to the color of the surrounding environment correctly with high hue and saturation.

As the eyes get tired, the nerves start to fill up with blood, and then, the red hue becomes bolder than normal. Both the background and the objects in the animation will become red.

There is also another situation in which the color shows low saturation when people aren't opening their eyes because there's no light passing through the nerves.

This color palette was applied to the entire story to ensure consistency.

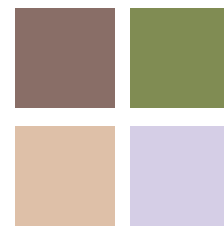
*Represent the  
color after eyes  
are getting tired*



*Represent the  
color before eyes  
are getting tired*



*Color with low  
saturation*





# Story Script

The author made the eyeballs world as a low-poly world with several different landscapes like the forest, Snow Mountains, plains, lakes, and Lava Mountains.

It has several features. It is an optical drive device, which runs processes that can convert light energy into any object inside the world of the eyeball, such as trees or flowers.

The energy is passing through the nerves of the eyes. In the low -poly world, the audience can see chains show up which represents the nerves can let human eyes see the world.

When the light passes through the chains, it will move giving energy to the specific objects on the landscape, such as the trees, flowers, or clouds to make them colorful and the creatures, such as fish, as lively as possible. With light creating immense beauty in the eyeball's world.

However, when the chains stress the wall of the device for an incredibly long time, the chain will become red and vulnerable. Then, it will make eyes hurt, and the creatures and leaves of the trees will appear colder, just as the nerves of the eyes have become inflamed as people get tired.

In the end, after the scene of the erupting volcano and dropping rocks, the camera will pan out of the low-poly world, and the low-poly 3d modeled human eye will be displayed.

Using the destructive theme of the environment to raise awareness that excessive use of the eyes is harmful.

At last, the movie will show the viewers some advice about resting their eyes.

# Storyboard and Reading Scripts

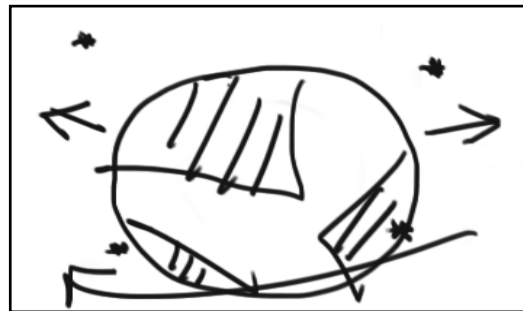
## Original Version



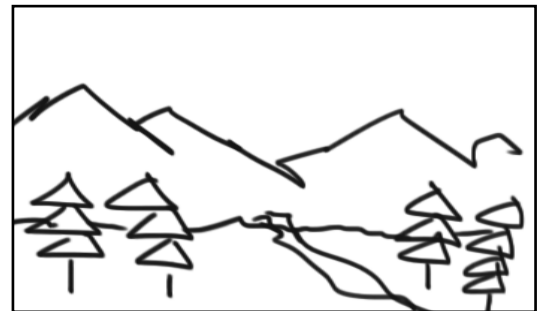
1. The world.



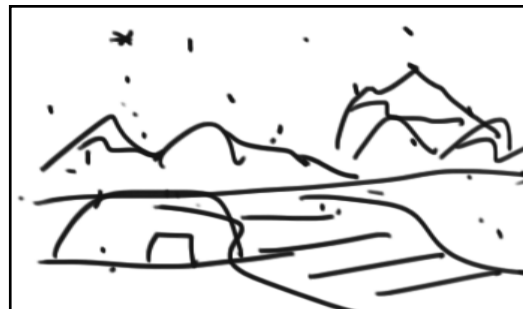
2. Human eyes can see the world.



3. They can see a lot of scenes.



4. Such as the forest



5. the snowy mountains.



6. and the beaches.



7. The light passes through the nerves



8. and give energy to the trees



9. the flowers



10. the fishes



11. and the clouds.



12. to make them look lively.



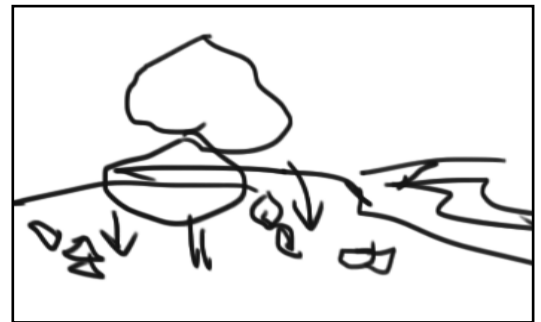
13. However, when eyes get tired.



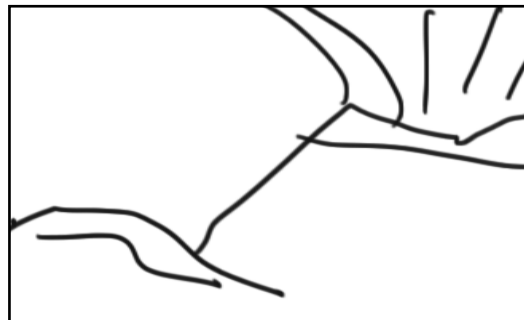
14. everything will look worse.



15. The ice will break into pieces.



16. The leaves will wither and fall to the ground.



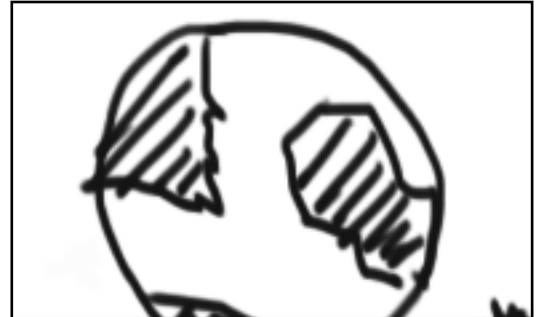
17. The volcano will erupt



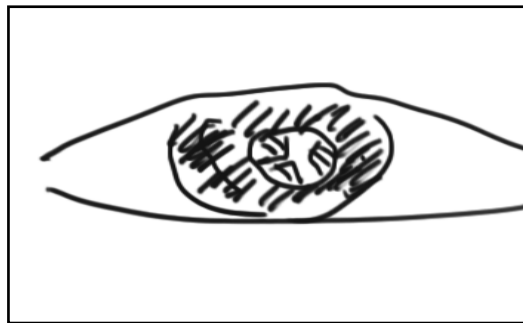
18. the magma will flow into the valley of the mountain.



19. and the rocks will roll down from the mountains.



20. This is the world of our eyes.

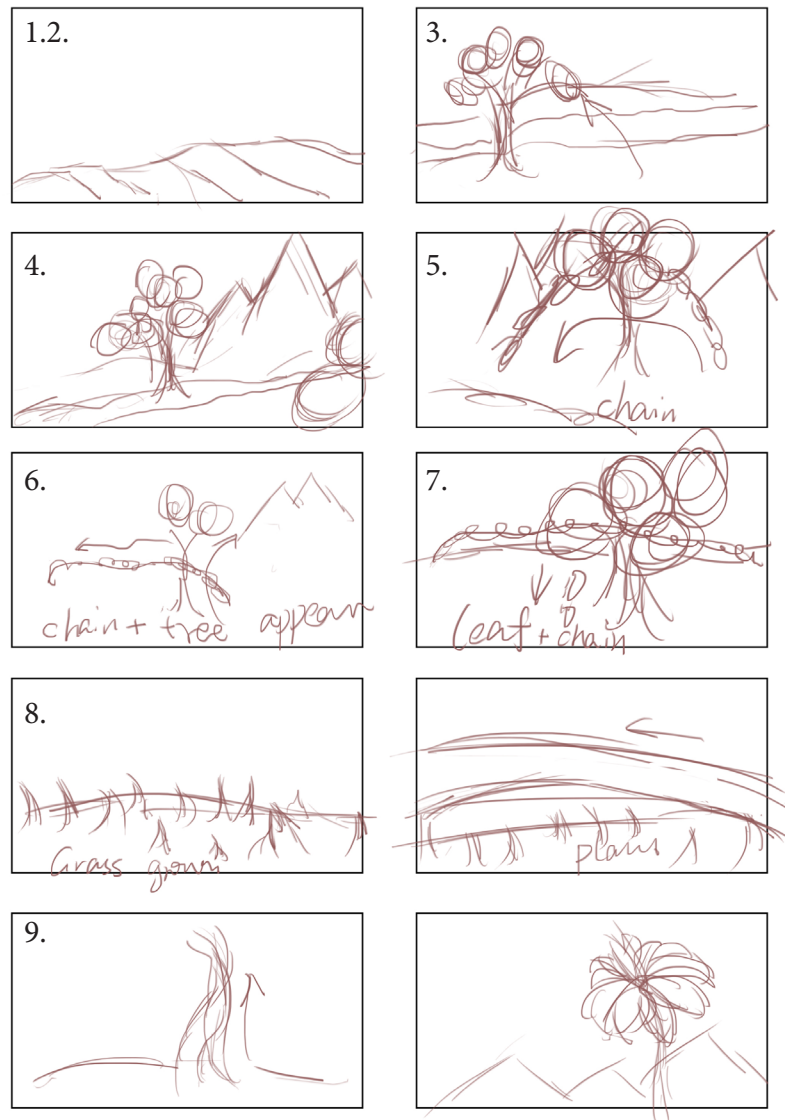


21. We must give our eyes some rest when they get tired.



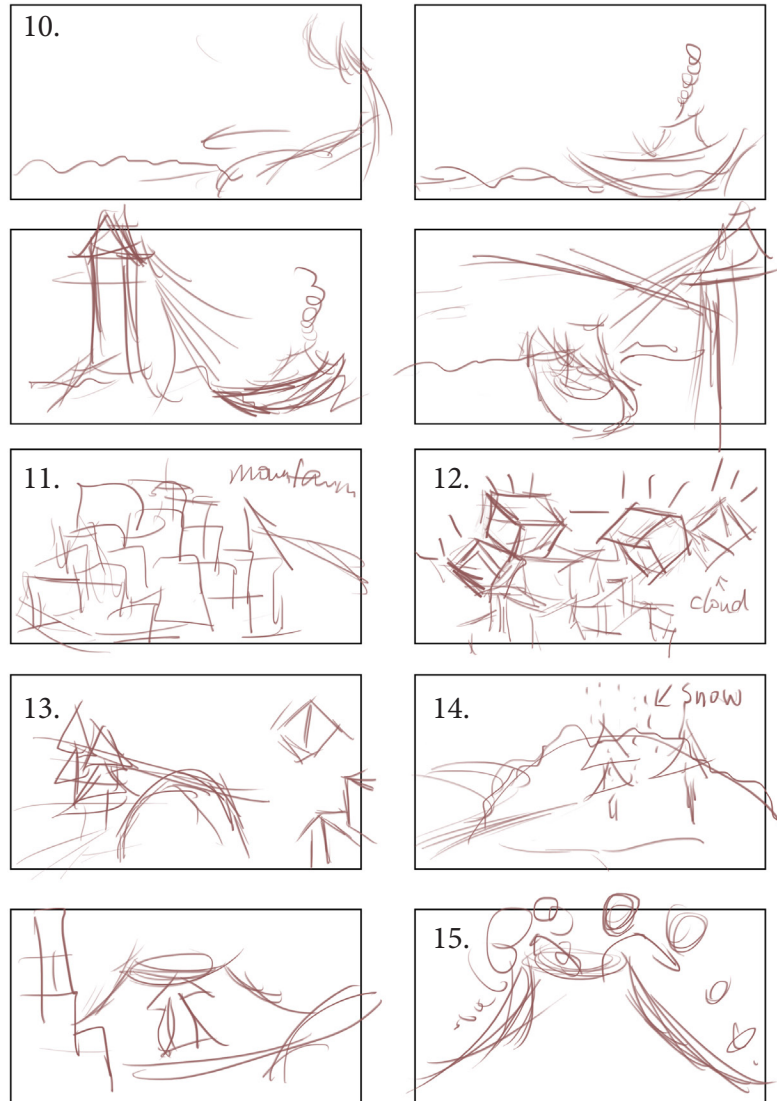
# Storyboard

## Final Version

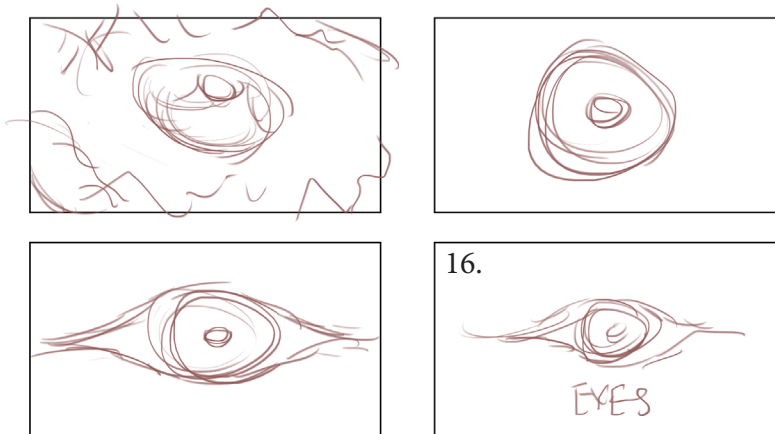


- 1 Eyes can see the world.
- 2 Such as the plains
- 3 Rivers
- 4 and the forests
- 5 Light passes through the nerves
- 6 Gives energy to the trees
- 7 to the leaves
- 8 to the grasses
- 9 to the plants

## Design Ideation



- 10 to the boats
- 11 to the montains
- 12 to the clouds
- 13 remember when eyes get tired
- 14 everthing will get cold
- 15 Volcano will erupt



# Design Process

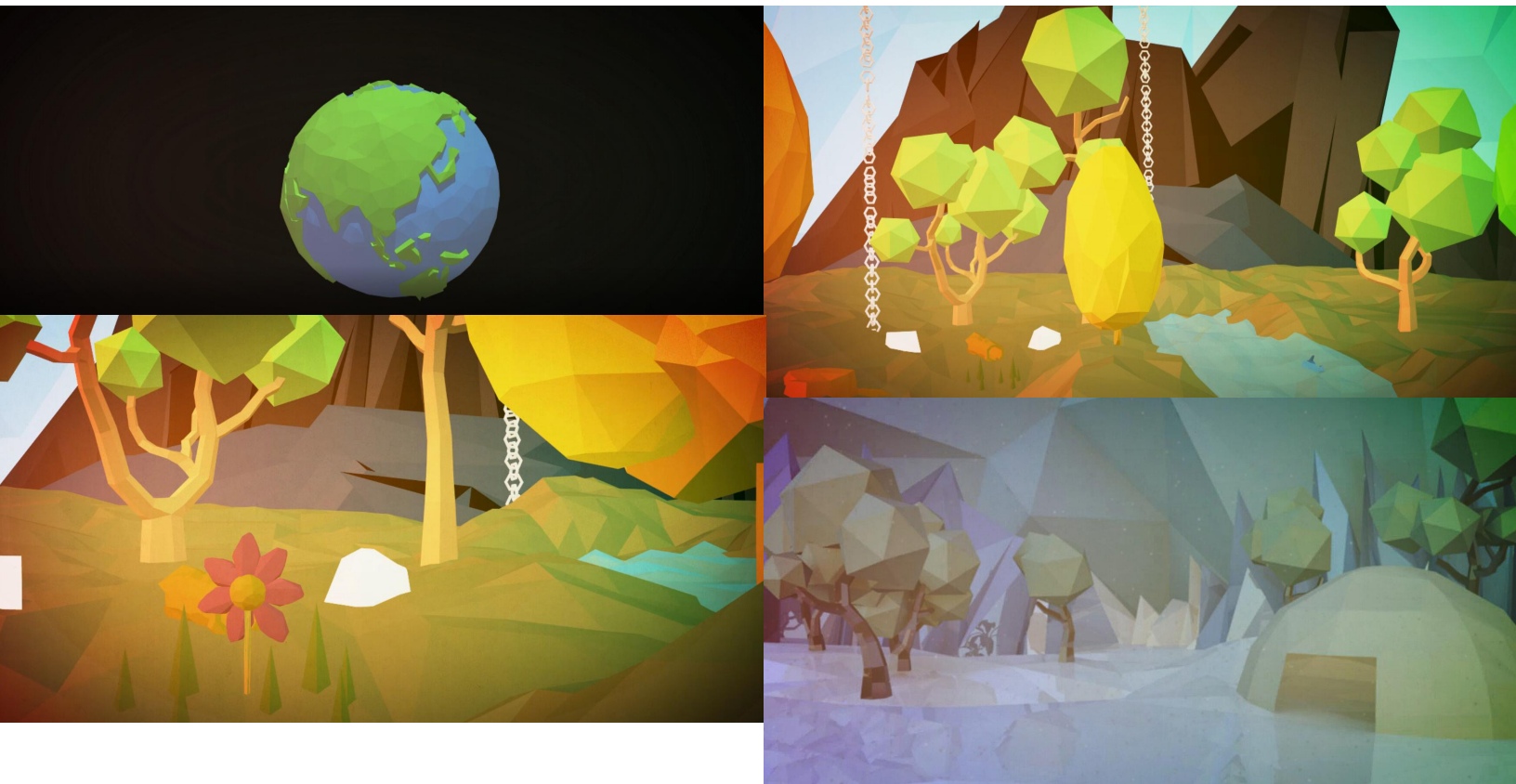
## Design of Visual Elements

After the direction of storyboard and script settings were decided, the design of visual elements were the next steps to improve animation to the next level. By using low-poly objects, it would be easier for the audience to get a fun feeling out of the animation.

All the low-poly objects are all abstractly based on the construction of the eyeball and what the eyeball sees from the real world.

the author tried using low-poly to build some frames in the early version. And the final version looks richer than the early one. The following pictures are a comparison between the old version and final version.

## Early Version



# Design Process

## Design of Animation Revision

After the decision of the changes of visual elements, I made several trial animations to see if the final result is in line with my expectation.

In the early version, the main content of the animation is just different parts of plains exchanging over time. But this has nothing to do with the structure of our eyeballs. And camera movement only moves in and moves off. This kind of movement is too simple to fit the thesis level. And the animations of the objects are not going smoothly. But in the early version I know, the low poly animation is smooth for the audience to understand what I want to show them and is more relaxed than the one using the reality style.

In the final version of the animation, I want **the Soul's Speaker** to be an excellent advertisement for the audience to know the importance of our eyes. So every single design should be tightly focused on the eyes. I focus on the different parts of the design below:

- Ground design and animation
- Objects Animation
- Texture Design
- Z-depth layer Design
- Camera movement
- Hue and situation adjustment



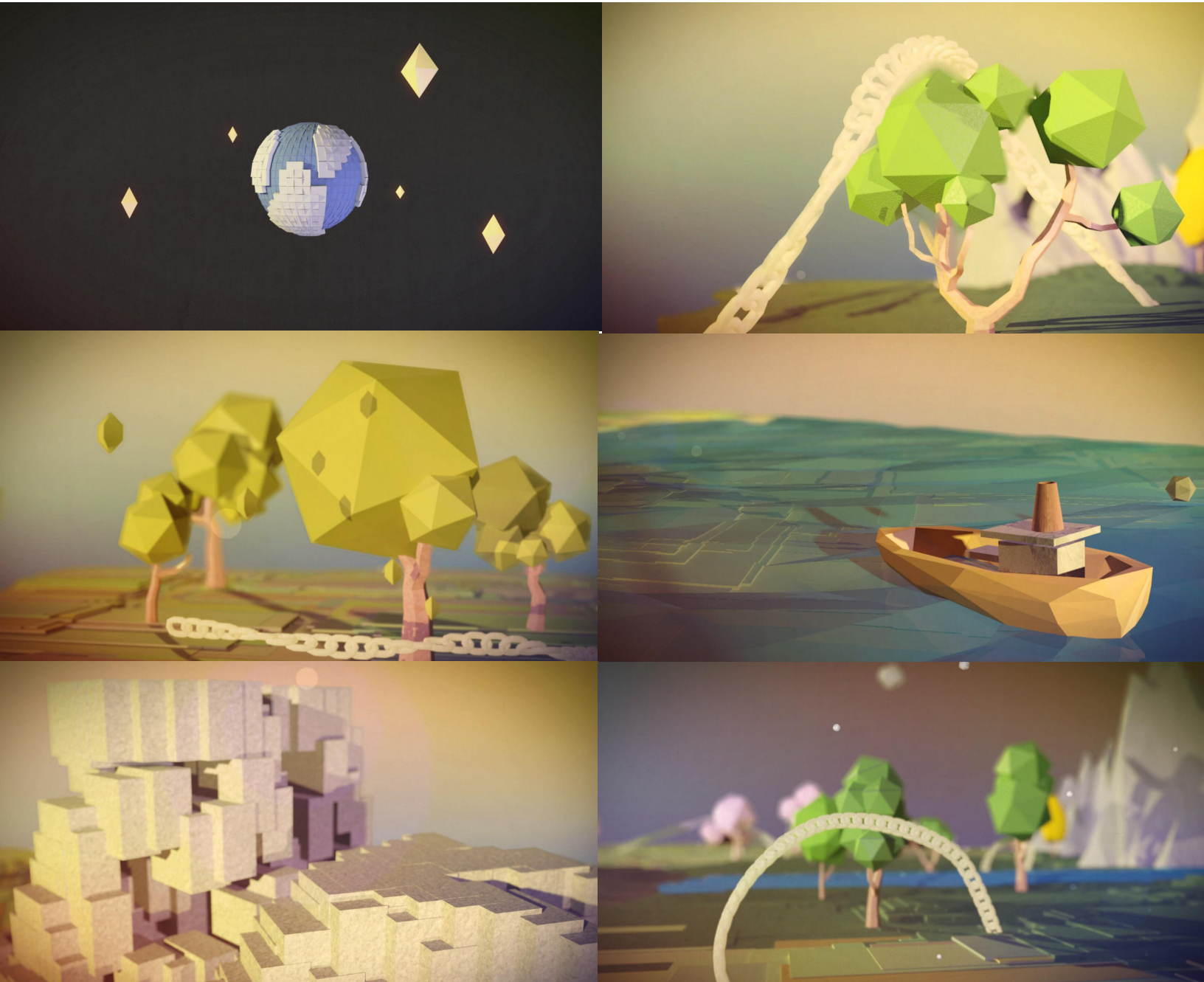
# Design Process

Early Concept



# Design Process

Latest Version



# Design Process

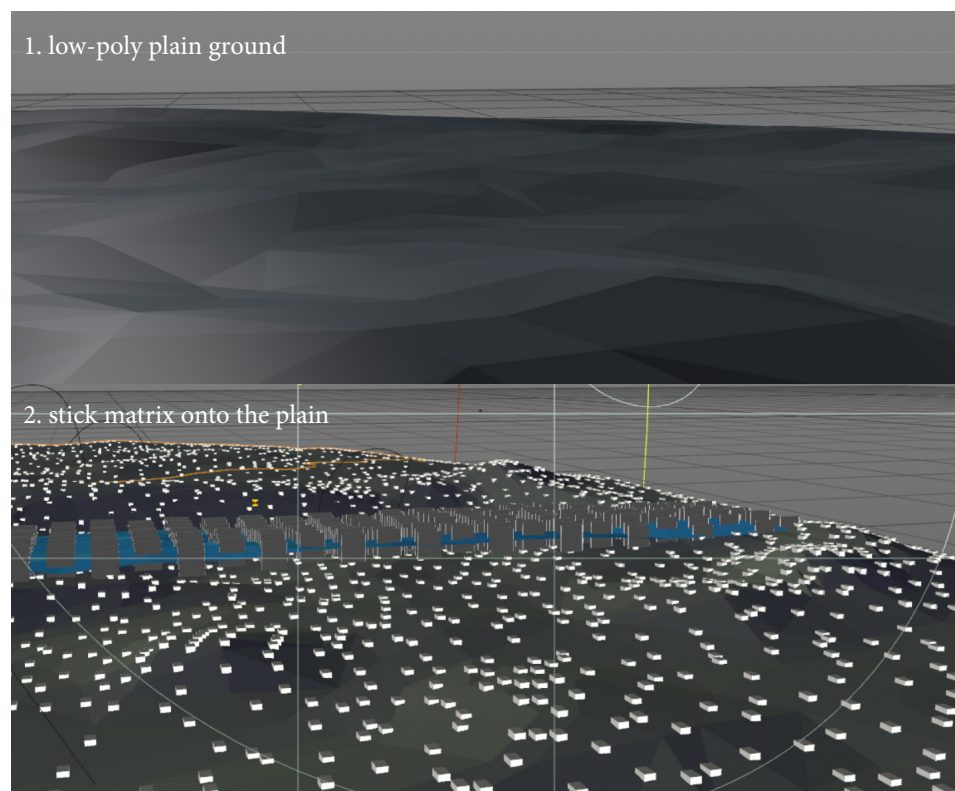
## Ground Design

First of all, sculpt it as a low poly ground in Maya using the sculpting tool. Then used the matrix tool in Cinema 4D to make particles on the ground's surface, following up with the Clone tool to make polygons stick to the particles.

Because it is a low-poly world, the ground is constructed of polygons and when animated shows up frame by frame.

The overall map of the ground is round in shape because the shape of our eyes is also round. And in the end of the animations will evolve into the human eyes.

3D cameras and objects were made included in the animation with the support of the software Maxon Cinema 4D.



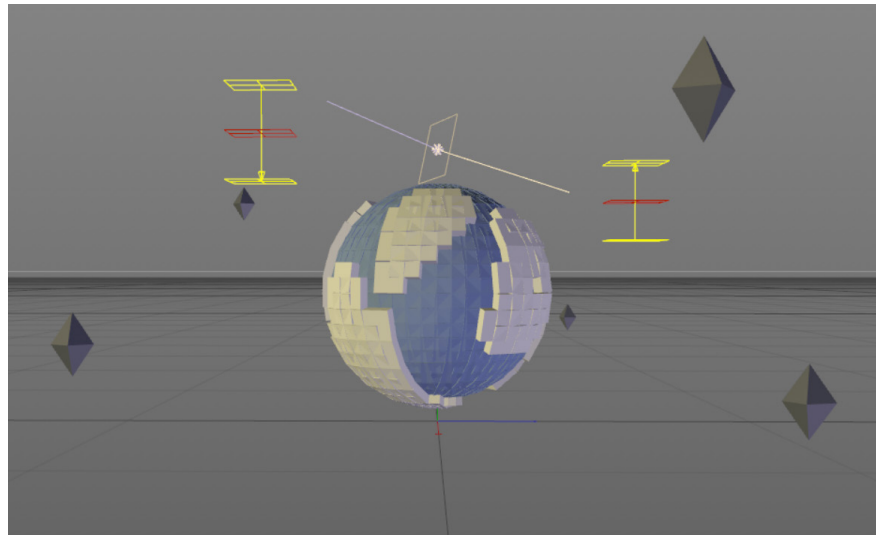


# Design Process

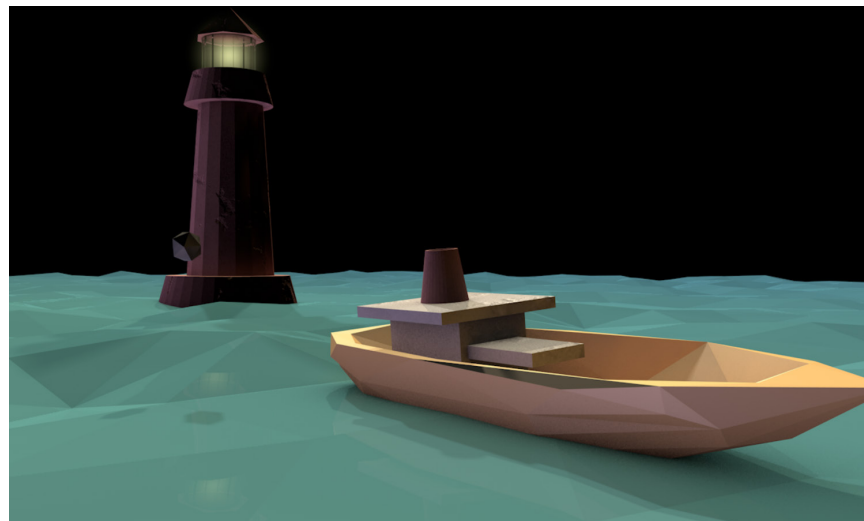
## Objects Design

There are many kinds of low-poly objects in the thesis such as the plains, trees, flowers, plants, boats, clouds and so on. To make them as a whole family, the author usually used the triangle to make them simple.

Most parts of the objects are made in Maya and animated in C4D. It is easier to make animation in C4D if most of the objects are using simple polygons rather than realistic rendering.



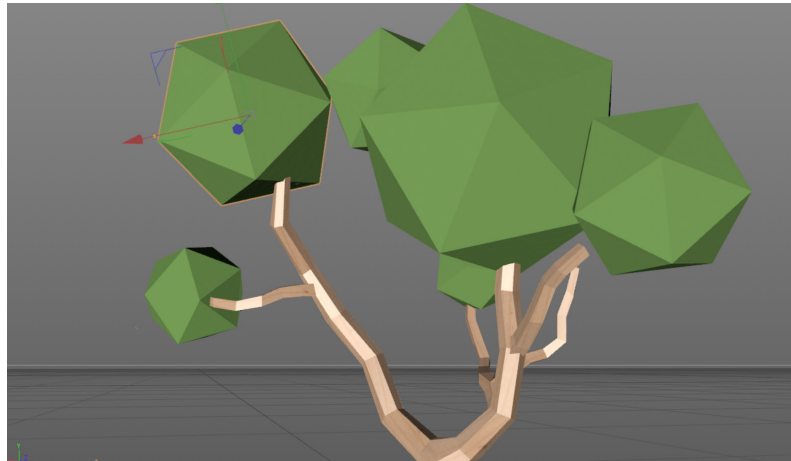
1. Earth was made up of polygons with several lands using different layers.



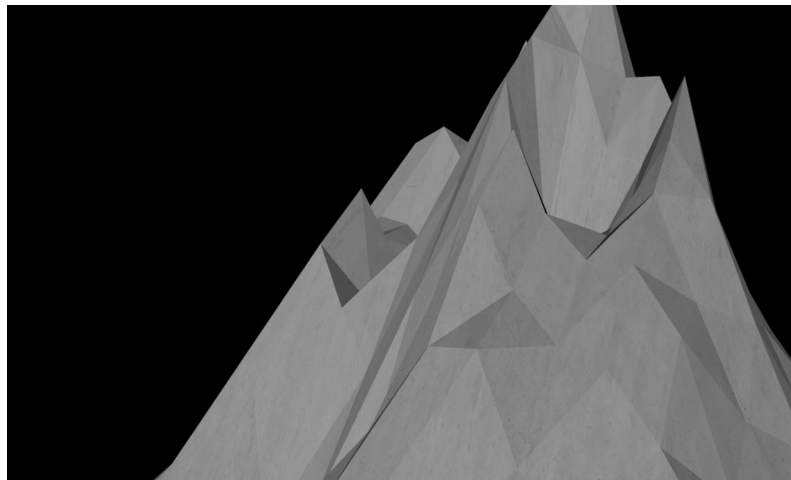
2. Boats and light towers were modeled in Maya and animated in C4D.

# Design Process

## Objects Design



3. Using multiple polygons to build trees and make them separately so that it can make the animation last.



4. Mountains were made by folding the low-poly plains, and subtracting the amount of polygons. Then add the melt effect to cut the bottom part that isn't used.

## Texture Design

Concrete	Glass	Mineral	Mat.1	Cement	Yancong	Glossy 1	Grass	Birch	Concrete	Concrete	Concrete	Concrete	Channe	Liquid 1	Mud	lambert1	phong2	lambert1	lambert1	Concrete	
Sculptu1	Glass	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	lambert1	Glass R1	lambert1	
Grass	TreesLo	TreesLo	TreesLo	Bush m1	Lowpol1	Lowpol1	Lowpol1	Lowpol1	Treetop	trunk 1	treetop	trunk 2	treetop	Tree tru 3	lambert1	lambert1	lambert1	lambert1	lambert1	sky	

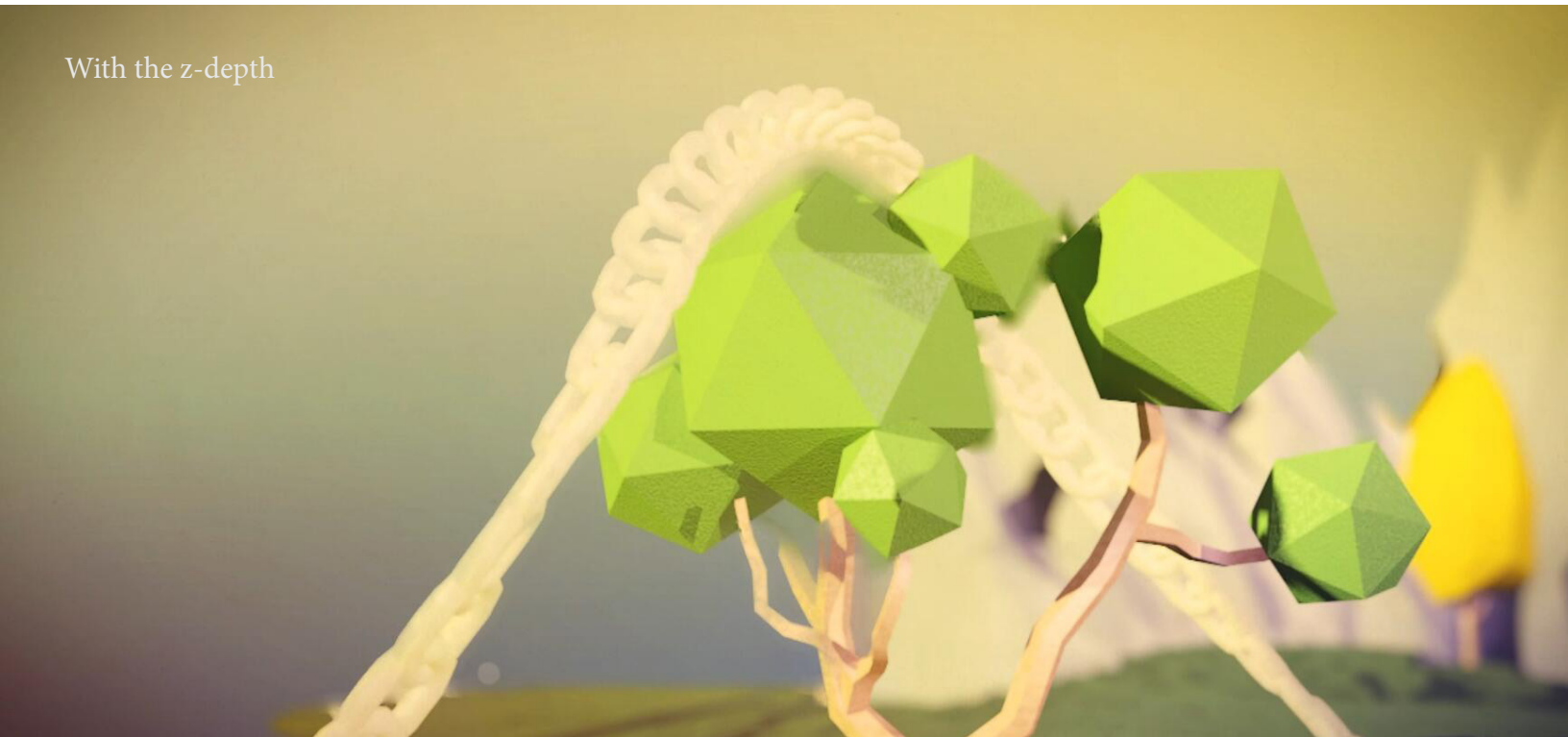
For example, to add a real feeling to the texture, the author added several different layers, like noise effects, so that the lava texture has more of an ash layer on it.

# Design Process

## Z-depth layer

To make the final rendering feel more powerful and convincing, added a Z-depth layer on to every single rendering frame is very important. It helps emphasize the main object that the audience needs to see, and it smoothens the shadows so that they don't appear too sharp. Below is the difference between the picture with and without the z-depth layer.

With the z-depth



Without the z-depth





# Design Process

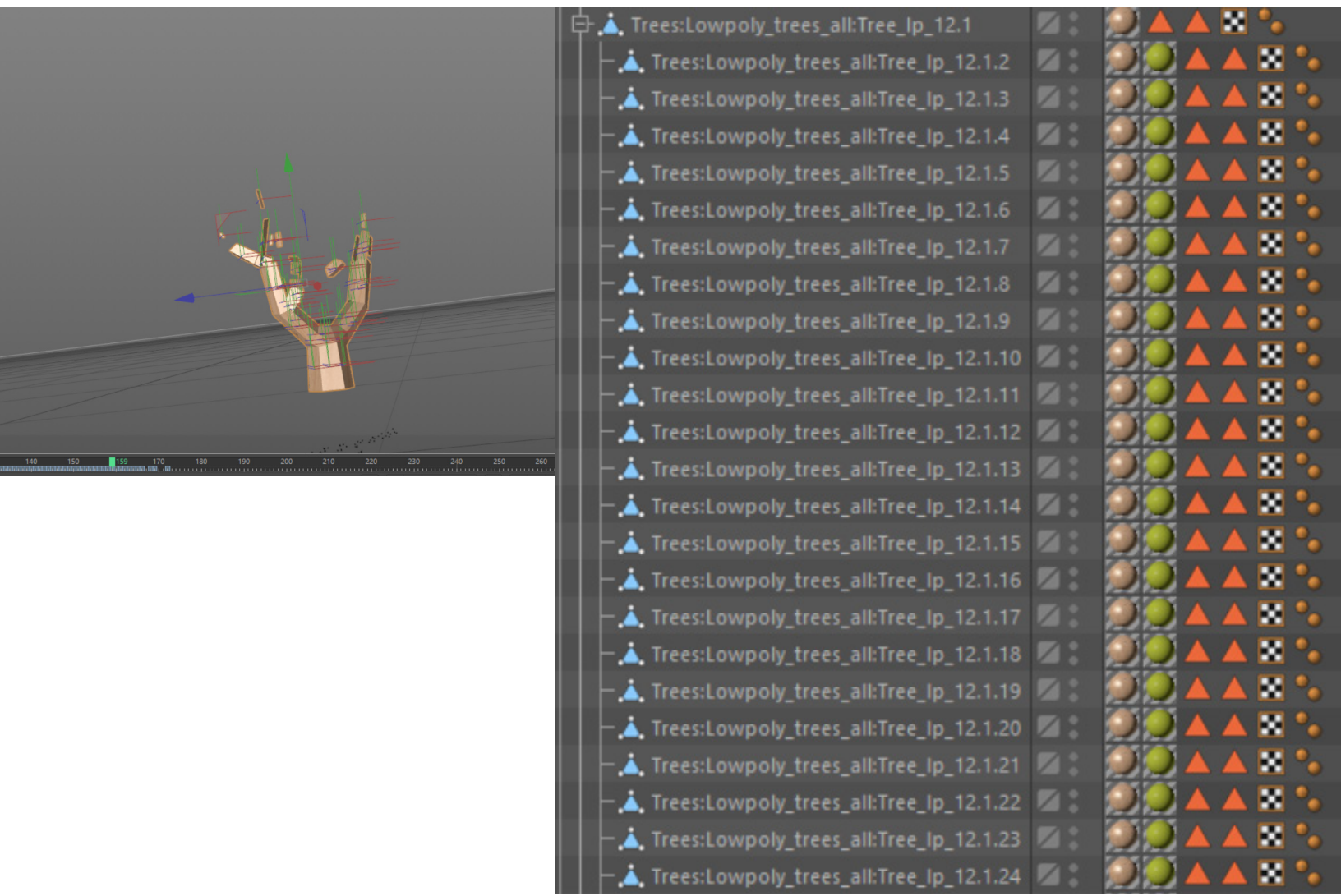
## Objects Animation Design

The most important part of the thesis is the animation of the objects.

A good animation can give soul to the objects and allow the audience to recognize the crucial role of our eyes.

### Animation of Trees

The author separated the trees as every single face of each polygon, and show them one by one.



# Design Process

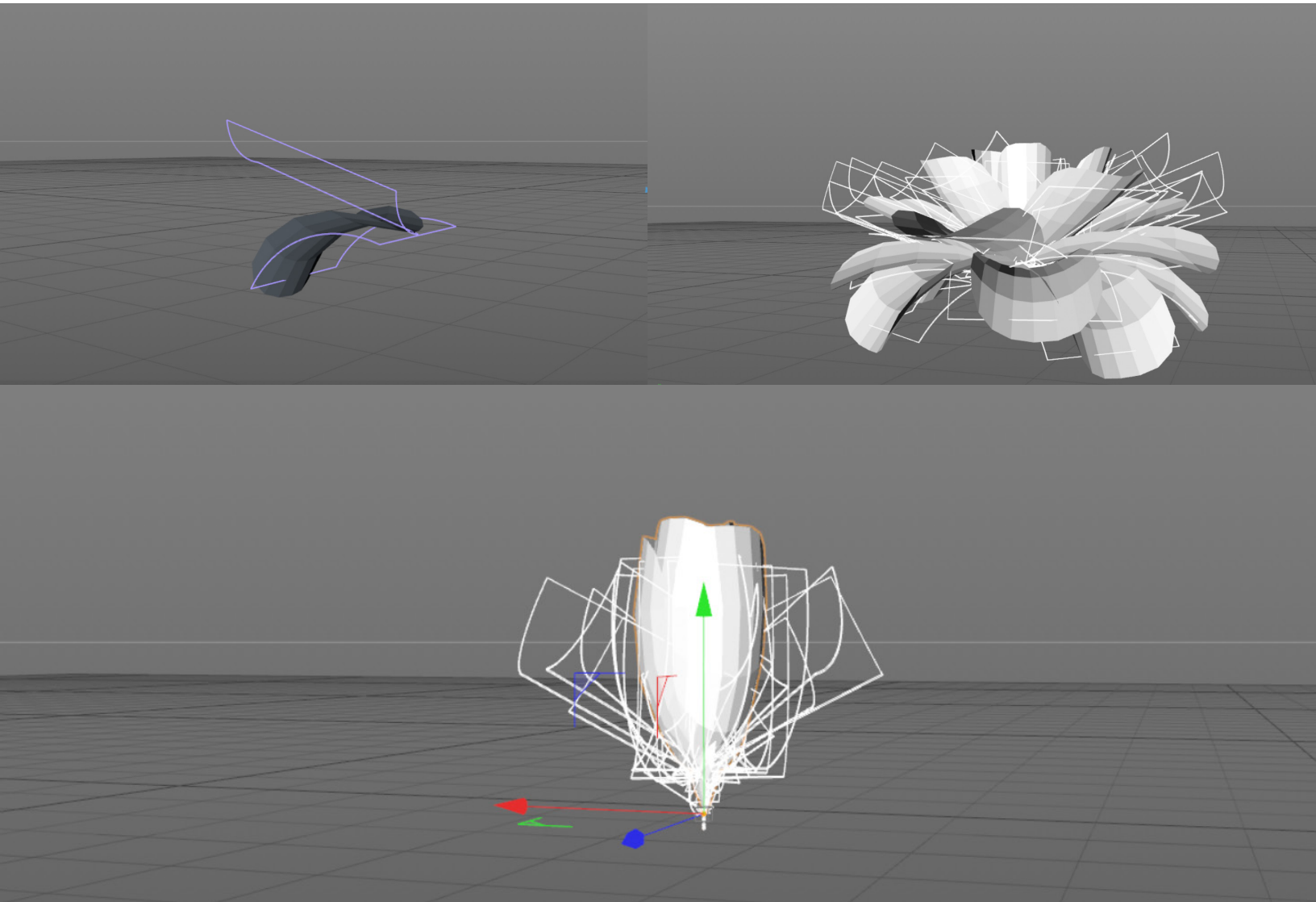
## Objects Animation Design

### Animation of Flowers

The flowers' animation is divided into two different parts which are the petal's animation and root's animation.

An excellent flower animation can make the flower petal grow slowly and smoothly. First, render the single petal animation from flower buds to petals in full bloom. Then clone the individual parts as much as 50 times and give the step effects to them so that the leaves bloom separately.

Also, thanks for the professor Shaun's advice, the author scales down the size of the petals so that it shows more effectively fit into the world.

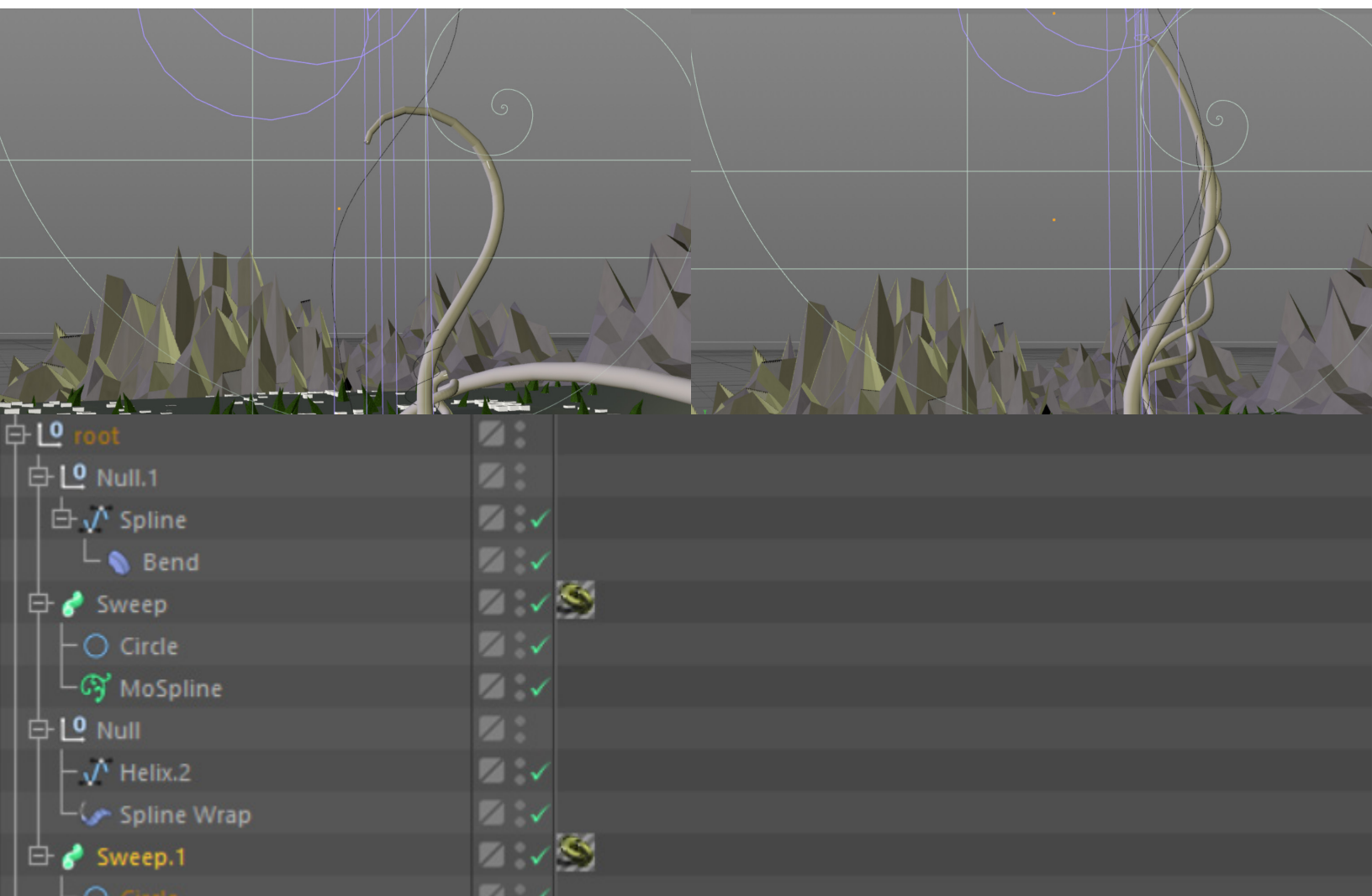


# Design Process

## Objects Animation Design

### Animation of Flowers

The second part of the animation is the roots. Made the circle line as the base shape. And then use the sweep effects to make the line to the face. Then it grows through the spline using the effects named Mospline.



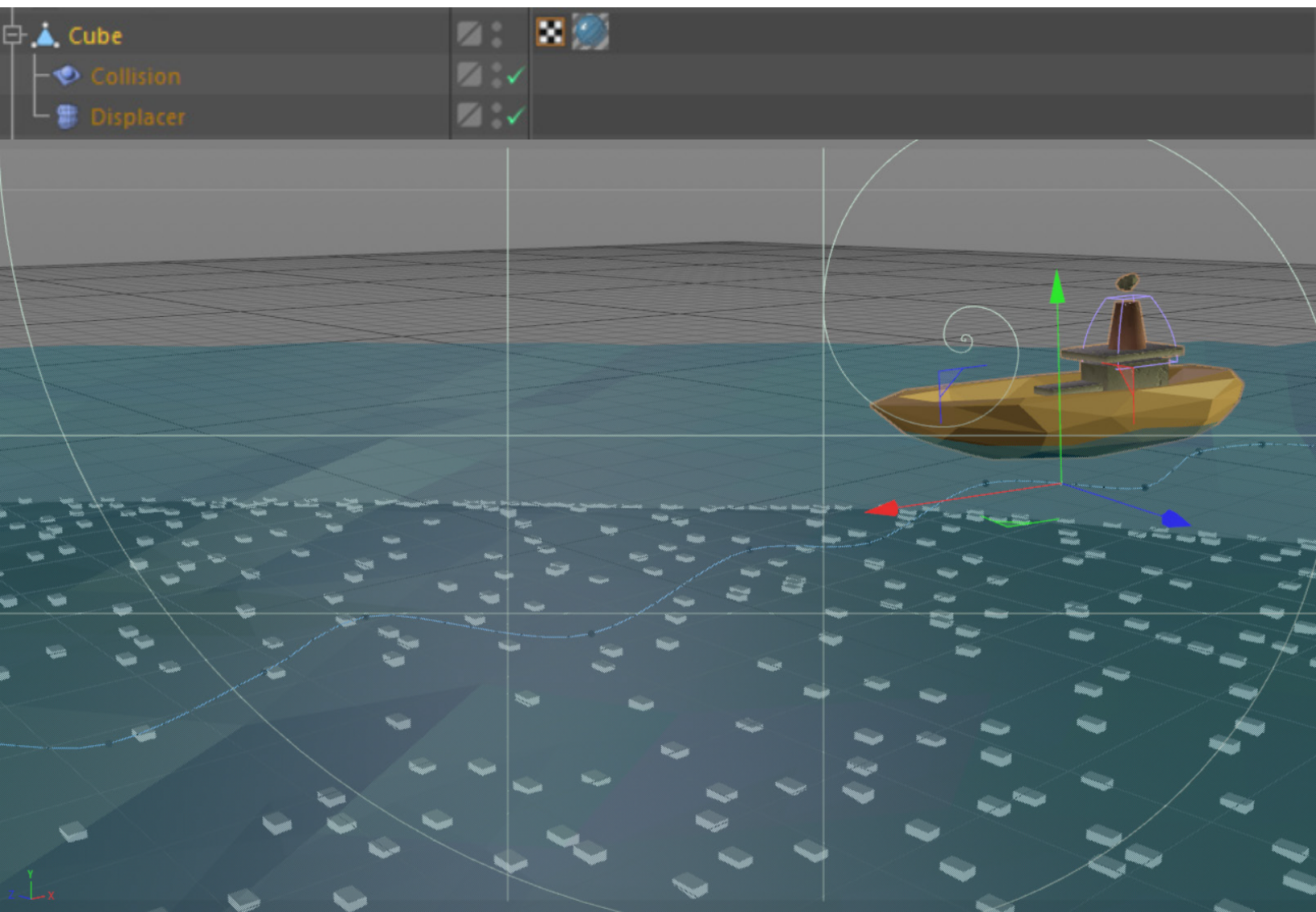


# Design Process

## Objects Animation Design

### Animation of Lakes

The lake is made from a low poly plain model. The boat is floating above the surface of the water. So the interaction between the boat and the water is very important, and in the animation, use collision effects and adjust the restore shape, stiffness and strut to make the animation more interesting.



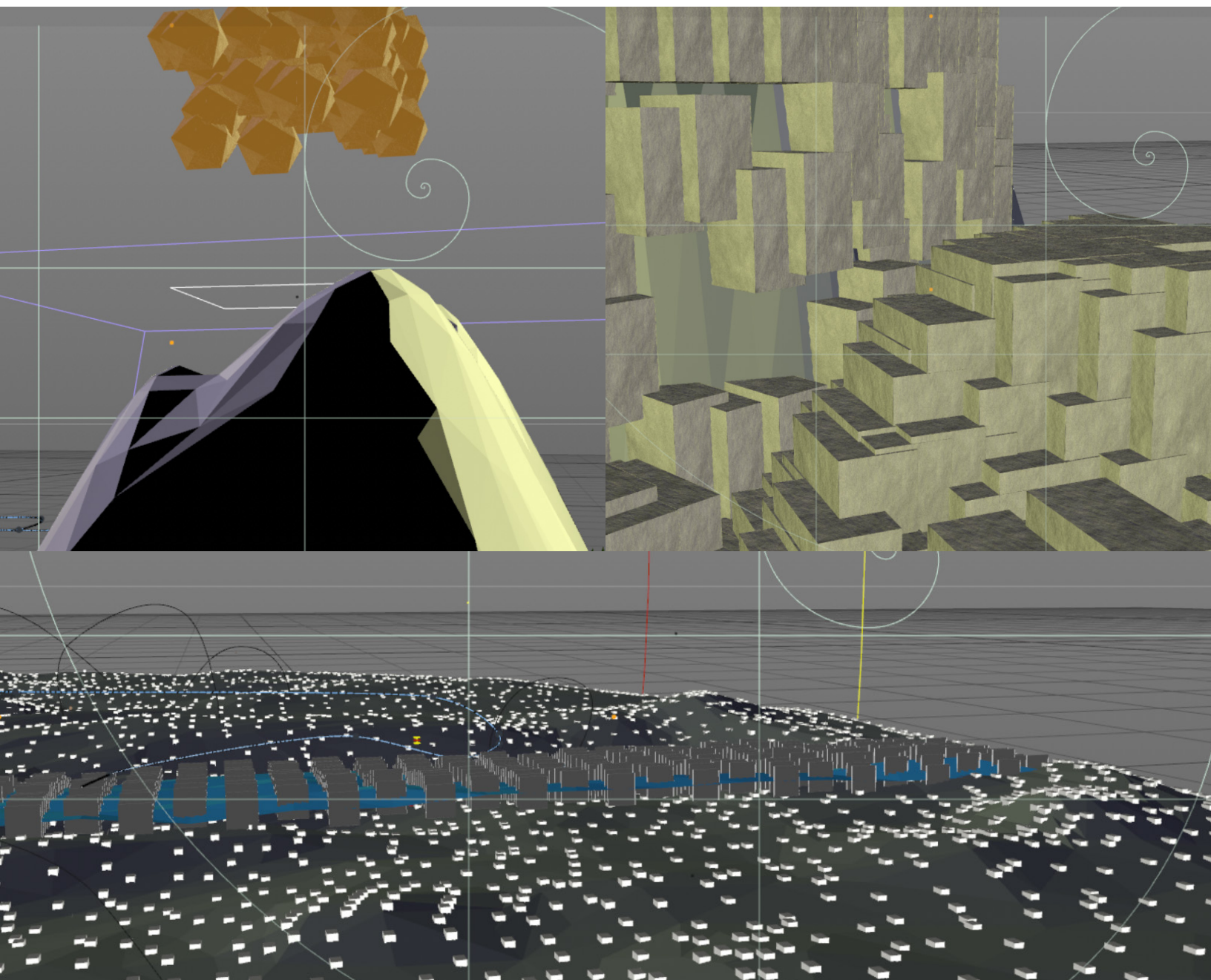


# Design Process

## Particle Animation Design

Particle Animation is used frequently in **the soul's speakers**.

Such as the smog shooting from the boat, the matrix dots constructed off the grounds and mountains, the rocks shooting from the volcano and the leaves falling down to the ground.

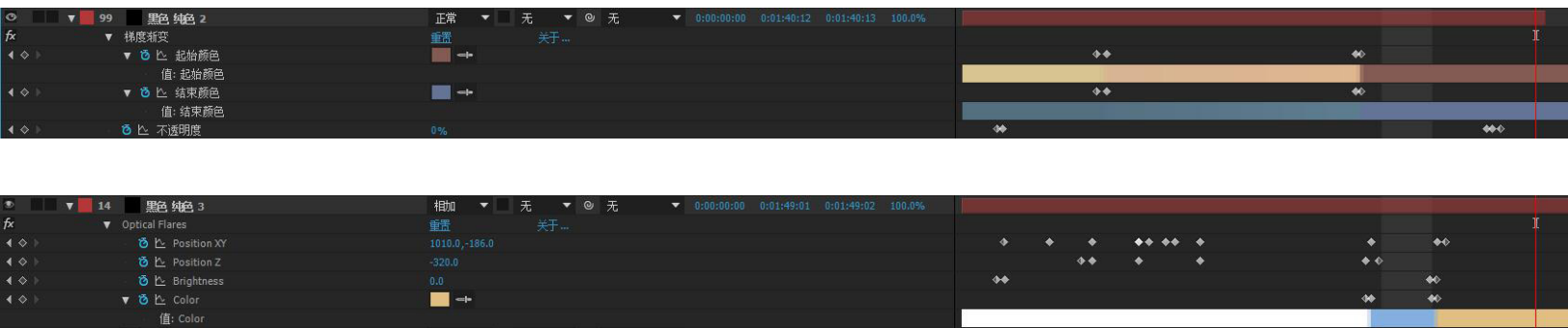


# Design Process

## Final Adjustment

The final step for the visual parts of the thesis are the hue and Situation parts of the animation including the background light and the transitions from warm to the cold atmospheres.

Adobe After Effects was used to add the 2D sunlight layers to add to the overall visual feeling of comfort in the animation. Also, several layers were adjusted to fix the curve and Hue of the atmosphere. These revisions visually help the audience become more engaged with the project.



Finally, the speed of the animation was adjusted to make the motion smoother.



# Conclusion

From the process of finishing the animation, the author gained lots of valuable experience towards design careers. The revisions and draft versions of the mountains in the thesis show that good animation needs strict attitudes both for the designer, and for the thesis. The overall process is very frustrating with many bugs and a fixed version. the author needs to focus on the advice from the advisers, and make the right determination to achieve the final work.

Of course, the most important thing is that after the final process of the thesis, the author improves across multiple places in the technical design methods and progress especially within the aspects of low poly animation. Such as the:

- Low-poly modeling
- Low-poly object Animation
- Z-depth of the Camera
- Smooth Movement of the Camera
- Particles using in the animation

Finally, the design process is much more important than technical skill. A correct direction of the design process can make the people spend less time finishing a much more exciting work.

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Master of Fine Arts  
Visual Communication Design  
School of Design  
College of Imaging Arts and Sciences  
Rochester Institute of Technology

# **The Soul's Speaker**

**Give your eyes some rest**

**Fuye Zhang**  
MFA Candidate

Visual Communication Design MFA Program  
School of Design  
College of Imaging Arts & Sciences  
Rochester Institute of Technology

**Thesis Proposal for the Master of Fine Arts Degree**

Rochester Institute of Technology  
College of Imaging Arts and Sciences  
School of Design  
MFA Visual Communication Design

**Title** The Soul's Speaker – Protect the Eyes, Make world clear  
**Submitted by** Fuye Zhang  
**Date** October 16, 2016

**Thesis Committee Approval**

**Chief Thesis Adviser** Daniel DeLuna, Visual Communication Design

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Signature of Chief Thesis Adviser      Date

**Associate Thesis Adviser** Shaun Foster, Visual Communication Design

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Signature of Associate Thesis Adviser      Date

**Associate Thesis Adviser** Chris Jackson, Visual Communication Design

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Signature of Associate Thesis Adviser      Date

**MFA Thesis Candidate** Fuye Zhang

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Signature of MFA Thesis Candidate      Date

# Table of Contents

---

**Abstract**

---

**Introduction**

---

**Survey of Literature**

---

**Design Ideation**

---

**Thesis Statement**

---

**Timeline**

---

**Bibliography**

# Abstract

The students studying in colleges often fix their eyes on books, on computer screens and archives for a long time to gain knowledge. As a result of this, their eyeballs often turn red out of fatigue.<sup>[1]</sup> Researches have shown that college students lack the awareness of the benefits of giving their eyes some rest. However, there are a few eye protection advertisements which suggest the need for students to give their eyes some rest. As a designer, I need to let people know the important roles that eyes play in the human body. I feel it is important for designers to produce work that deals with social problems.

The aim of this thesis is to design a low-poly 3d promotional animation to raise awareness of the importance of giving the eyes some rest. In animation, I designed the eyeballs as a construction of an abstract light-based system. The environmental design of the animation is based on every part of the eyes' construction. Through this construction and interpretation of environmental destruction, I hope to enlighten the people on the dangers of using the eyes excessively.

**Keywords**

Visual Communication Design  
Design  
Human Needs  
Health  
Eyes  
Promotion Animation

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[1] Aimee Surtenich, Red Eyes, Bloodshot Eyes, <http://www.allaboutvision.com/conditions/red-eyes.htm>

# Problem Statement

In my opinion, once an artist wants to draw a portrait, they will spend most of their time drawing the eyes, because the eyes can be used to express their mood without speaking any language. The eyes are important organs of the human. Although people have innocent eyes during their childhood, it becomes vicious as they get old. In the social psychology study, the eyes are the windows to people's soul in which moods are expressed.

According to the Face of New Testament Studies, myopia is caused by different reasons which include the internal and external factor. One of the internal reasons is the internal factor. Myopia results from a mismatch between the eye's optical power and its axial length. The precise nature of the structural changes in the posterior chamber that leads to myopia seems to vary and may be the result of the stretch which is limited to the equatorial region, global expansion of the vitreous chamber, posterior pole elongation or some combination of these factors.<sup>[2]</sup>

The external reason is the environmental factor, when young people are reading or working together in close distance, the rectus medialis which is the part of the extrinsic part of the eyeball muscle will put some pressure on the eyes, and the pressure inside the eyes will become stronger. If the extrinsic eyeball muscle and ciliary muscle are in the stress state for a long time, it will cause the ciliary muscle spasm, which would result in vision loss.<sup>[3]</sup>

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[2] Prema Ganesan, Pharmaceutical intervention for myopia control, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3023964/>

[3] Muscles of the eyes, <http://www.musclesused.com/muscles-eyes/>



In this project, I will be focusing on the external factor, which is the environmental factor. What I am going to do is to make a low-poly 3D promotional animation, to let people know the important role that eyes play in the human body, to know the eye's complex construction, and help people raise awareness about protecting the eyes. I feel it is important for designers to produce work that deals with social problems.

This thesis proposed a study that explores how designing a 3D promotional animation can help to raise awareness of the importance of giving their eyes some rest. The research includes education design, illustration design, 3D animation design, low-poly 3D modeling design and eyes construction information design as related to students, aiming to answer the following questions:

- Selected Key Questions**
- How do the eyes nerves and muscles change when the eyes become myopic?
  - How much damage can the eyes take when students use it excessively?
  - What are the social and ethical responsibilities of a designer?
  - How may cause a designer motivate change through computer graphics design?
  - How may cause a designer motivate change through 3D animation design?

# Survey of Literature

## Design Info

### **Design: Models of Change**

*by Ken Baynes*

This book is telling us that design should provide a favorable environment for the evolution of human society. It must be positive for human society to improve. And it needs to identify a malignant role played by design in the environmental, social and economic crises all over the world.

### **Computer Visualization for the Theatre : 3D Modelling for Designers**

*by Christine A. White, Gavin Carver*

This book is telling us that 3d modeling can express the thought of the designer to the viewers in different ways. The book introduces the technology of computer visualization providing many real samples applicable to all software. It can use different ways of techniques utilized in the wider design considerations of performance projects.

### **Numerical Methods: Design, Analysis, and Computer Implementation of Algorithms**

*by Anne Greenbaum, Timothy P. Chartier*

The book is telling us that there can be many methods to emphasize different aspects such as design, analysis, or computer implementation on the background. So it gives me the feeling that I can do many various aspects of expressing the eyes 3d promotion animation. What is good for me is that the materials are all can be found online which I can learn the details from them to improve my thesis.

# Survey of Literature

## Design Info

### LIMBO

*Developed by Playdead and Double Eleven  
Microsoft Studios, Playdead. 2010.*

LIMBO is a puzzle video game. The player can use the player like a boy going through dangerous environments when he's looking for his missing sister. The developer built the game's puzzles which are expecting the player to fail a lot of times. And then they will find the correct solution.

This game uses black-and-white tones, lighting, film grain effects and minimal ambient sounds to create an eerie Atmosphere associated with the horror genre.

### Amelia and Terror of the Night

*Developed by OhNoo Studio  
CreateSpace Independent Publishing Platform. 2012.*

Amelia and Terror of the Night is an interesting interactive story book app not only for children but the young students.

The interesting part of this app design is not only in art style but also in unique 3D effect and animations. The design of the character little girl Amelia and her three animal friends give me a nice feeling to develop my thesis.

# Survey of Literature

## Eyes Info

### **A Simple Guide to Myopia and Refractive Eye Diseases**

*by Kenneth Kee*

This book is telling us one of the eye disease, which is named Refractive Eye Disease, can cause the error in the focusing of light by the eye. It tells the reason that how to have the poorer eye vision.

### **Improve Your Eyesight: A Guide to the Bates Method for Better Eyesight Without Glasses**

*by Jonathan Barnes*

This book is telling the people that wearing glasses is not the only way to improve the eyesight. The author recommends the person who has poor eye vision to let the eyes restore the sight by themselves with relax and give enough rest of the nerves of the eyes.

### **Myopia**

*by Jeff Gardiner*

This novel is about the man who has the short-sightedness. But he doesn't defeat by myopia. He finds the world beautiful and exciting in the other way of using his myopia eyes. It gives me the sense that maybe low poly is a good way to do the thesis. Realistic is not the best way to see the way sometimes.

# Survey of Literature

## Eyes Info

### **A biometric investigation of late onset myopic eyes**

*by Acta Ophthalmol*

This book is telling us one form of the eyes diseases, which is named onset myopia in about 15-years-old young students who were both age and sex matched. The investments find the ultimate cause of late onset myopia. It gives us another way to present the world in the eyes which have the eyes diseases.

### **Steady-state accommodation and ocular biometry in late-onset myopia**

*by JDoc Ophthalmol*

This book is also telling us the form of the eyes diseases I mentioned above, which is named onset myopia in about 15-years-old young students who were both age and sex matched. But this book is more focusing on the reason and has more data and graphics compared to the formal one. I can know the precise details of the construction of the onset myopia.

# Survey of Literature

## Internet Recourses

### Earth Day “Rethink Butts”

<http://vimeo.com/63347105>

The “Rethink Butts” campaign is a creative 3d promotion animation, which sparks discussions and encourages the general public to think about tobacco trash in a new way. The rethink of the tobacco and the rendering of the scene is film level. What surprised me is the method that shows the secrets of the story, in the end, can make people exciting.

### OMEGA Co-Axial Chronometer - The perfect mechanical movement

<http://www.youtube.com/watch?v=ctj-RDbTBMU>

The rethink of the watch makes me exciting. After watching this 3d advertisement, I feel that the realistic is not the only way to represent the construction of the watch. We can use the imagination and make the watch out of precise forms to emphasize the real details of the watches' construction.

# Process

The Soul's Speaker is a 3D promotional animation, mainly using the 3d software Maya. The purpose of the design is to use the destruction of the in-eyes world environment built using 3d low-poly modeling to raise awareness of the damage of staring at things for a long time with the eyes. This is to let people especially students who often focus on their studies with much pressure to know how important it is for them to give their eyes some rest.

The developmental process includes following stages: studying and analyzing the recourses of the construction of eyes, and learning how the eyes get damage when people stare at objects for a long time; brainstorming visual design for low-poly objects and low-poly 3d environmental design; creating story scripts and drawing storyboards; making 3d model, texture; Sound EFX and EFX; evaluating and modifying the design to improve the promotional animation. The elements of design includes character design and background layouts to create the in- eyes world using abstract methods. Also, I'll add the vocal explanation in the background to read the script, so that I can make the movie easier for the viewer understand the contents of the movie.

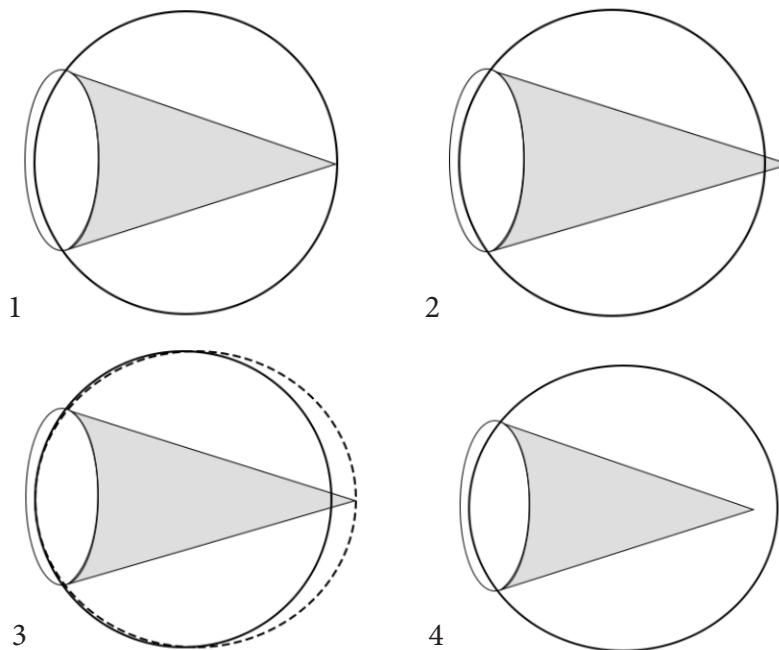
The Software utilized for the thesis consist of Adobe Acrobat Professional, After Effects, Audition, Illustrator, InDesign, Photoshop, AutoDesk Maya, AutoDeskMudbox and Cinema 4D.

The social public animation will be staged in 1min. I will use Maya to build the world model, the landscapes models, the objects and the creatures low-poly modeling inside the eyes. Lastly, I will use the key frame to animate the objects and camera movement. Also, I will use Maya and the particular effects in After Effects to finish the particle part, also, I will use Audition to make the Sound EFX and reading script edition.

**Sketches**

In order to let the users understand the principle of why the eyeballs would lose vision, I made this simple sketches to show the processes involved when eyes loses its function.

- 1 The eyes are watching the distant objects.
- 2 The eyes start to watch the close objects, the light's focus point is behind the wall of the retina.
- 3 The extrinsic muscle and ciliary muscle become stressed, and stretches the wall of the retina to fit the focus point of the light.
- 4 The wall can't return to the original state due to the ciliary muscle spasms that result from staring at the same objects in close distance for a long time.





**Design Inspiration/  
Personal Style**

After getting inspiration from existing promotional advertisements using the combination of low-poly 3d modeling and visual EFX, various ideas for the eyes protection animation were generated.

The visual style is like low-poly 3d modeling style and game design. It will need some of EFX created by After Effects, and use Mental Ray to render the scenes built by software Maya. The realistic rendering method is used to create an abstract in-eyes world.

Also, lighting and optical EFX is another direction that needs to be considered because it can make a nice variation between the cycles of day and night. It is a good choice to combine the EFX lightning and 3d environment.

## Color Palette

The subject matter of the thesis is that people often get tired when they stare at something for a long time, and the nerves of eyeballs will become inflamed and turn red due to stress.<sup>[4]</sup> Therefore, there are two main kinds of color palettes in general.

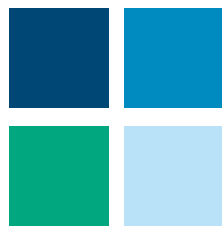
Before the eyes get tired, the nerves of eyeballs are relaxed, and it will adapt to the color of the surrounding environment correctly with high hue and saturation.

As the eyes get tired, the nerves of eyeballs start to get filled up with blood, and then, the red hue becomes higher than normal. Both the background and the objects in the animation will become red.

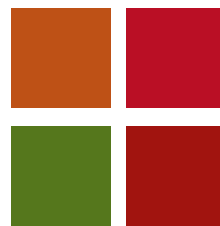
There's also another situation in which the color shows low saturation when people aren't opening their eyes because there's no light passage through the nerves of their eyeballs.

This color palette was applied to entire story to ensure consistency.

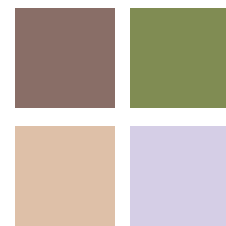
*Represent the  
color before eyes  
are getting tired*



*Represent the  
color after eyes  
are getting tired*



*Color with low  
saturation*




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[4] Aimee Surtenich, Red Eyes, Bloodshot Eyes, <http://www.allaboutvision.com/conditions/red-eyes.htm>



# Story Script

I made the eyeballs world as a low-poly world with several different landscapes like forest, snow mountains, beach, and lava mountain.

It has several features. It is an optical drive device. It has a process in which it can convert light energy into any objects inside the eyeball world such as trees, and flowers.

The energy are passing through the nerves of the eyes. In the low -poly world, i use chains to present the nerves.

When the light that passes through the chains, it will movegive energy to the specific objects on the landscalpes like trees, flowers, clouds to make them become colorful and the creatures like fished to make them become lively. With the lights beautifies the eyeball world.

However, when the chains stress the wall of device for an extremely long time, the chain will become red and vulnerable. Then, it falls down to the ground, and the creatures and leaves of the trees will burn out because the light device has overheated. Just because the nerves of the eyes will become inflamed as people get tired.

# Story Script

At the end, after the scene of the volcanic eruptions and dropping rocks, the camera will zoom out of the low-poly world, the low-poly 3d modeling human eye will be displayed.

I'm using the destruction of the environment theme to make raise awareness that excessive usage of the eyes is dangerous.

At last, the movie will show the viewers some words about giving their eyes some rest.

# Storyboard and Reading Scripts



1. The world.



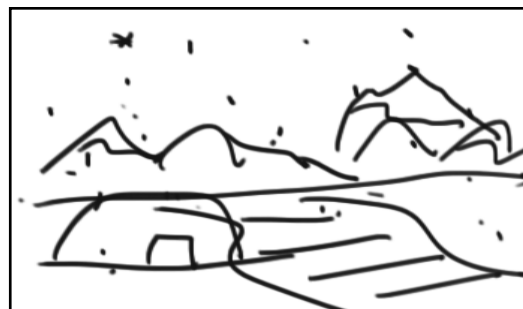
2. Human eyes can see the world.



3. They can see a lot of scenes.



4. Such as the forest



5. the snowy mountains.



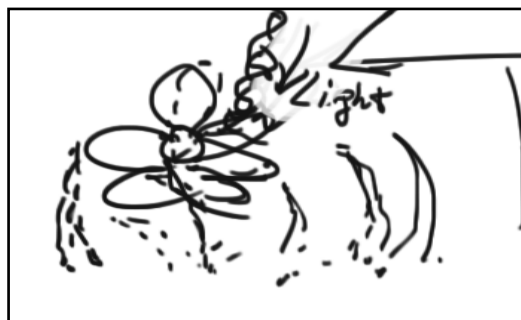
6. and the beaches.



7. The light passes through the nerves



8. and give energy to the trees



9. the flowers



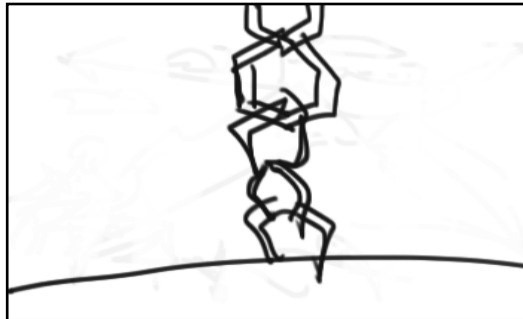
10. the fishes



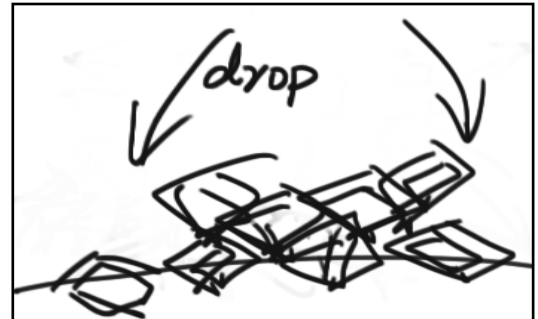
11. and the clouds.



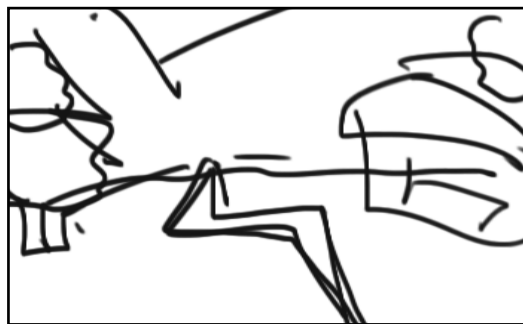
12. to make them look lively.



13. However, when eyes get tired.



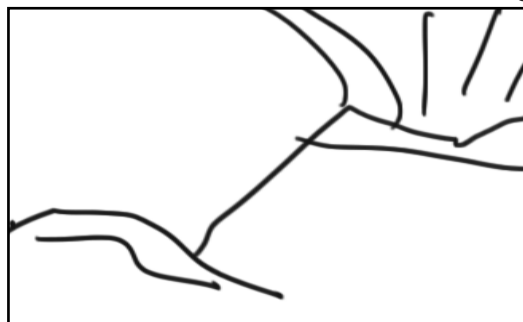
14. everything will look worse.



15. The ice will break into pieces.



16. The leaves will wither and fall to the ground.



17. The volcano will erupt

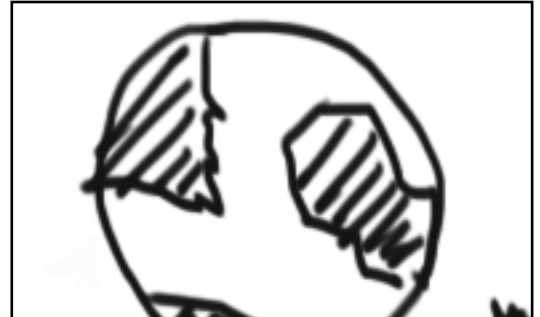


18. the magma will flow into the valley of the mountain.

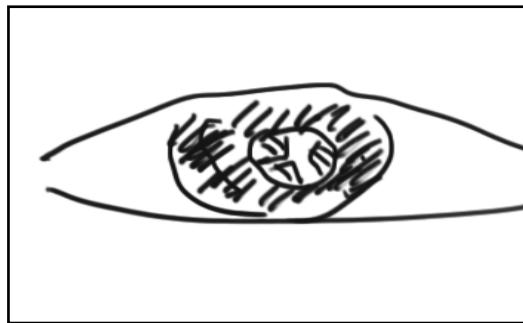




19. and the rocks will roll down from the mountains.



20. This is the world of our eyes.



21. We must give our eyes some rest when they get tired.

# Methodological Design

## Objective

The final design object will be a 3D promotion animation. It has 1 min duration time. This thesis aims to raise awareness of the importance to give the eyes some rest. The research included education design, illustration design, 3D animation design, 3D modeling design and eyes construction information design.

**Story:** In animation, I designed the eyeballs as a construction of an abstract light-based system. The environmental design of the animation is based on every part of the eyes' construction. Through the interpretation of environmental destruction and higher red hues of the scenes to let the people raise awareness that if they use their eyes excessively, I hope to enlighten the people on the dangers of using the eyes excessively.

**Visual Style:** low-poly 3d modeling and animation

### Creatures and Surround Low-poly Objects:

Earth with ocean and 4 lands

1 Eyeball

Forest landscape with 6 trees, 8 camp woods, 4 stones, 1 lake, 3 clouds  
5 flowers, 10 grasses, 3 fishes, 2 mountains, blue sky

Snowy landscape with 4 snowy trees, 5 snowy stones, 1 tent, 1 frozen lake, 4 clouds, 2 mountains, grey sky, snow particles

Beach landscape with 2 Coconut trees, 2 volleyballs, 3 clouds, ocean, 1 fish, 1 beach chair, sand, 4 shells, blue sky

Volcano landscape with 4 mountains and 1 volcano, 5 clouds, 10 trees, falling rocks and magma particles

The magma, camp fire using particle in Maya  
Day and Night sky with effects made by AE

## Deliverables

The final design object will be a 3D promotion animation. It will be displayed on desktop, and it will include the 1min animation.

# Methodological Design

## Approach

1. Study and analyze the construction of the eyeballs.
2. Talk about the other similar pieces and compare them to yours.
3. Brainstorm visual design principles and the design process that focus on the personal design style, creature and environmental design, camera moving, UV mapping of the objects, story telling, visual effects in After Effects and ncloth, particle effects in Maya.
4. Evaluate the final animation and obtain viewers' feedback, I'll ask them about the feeling after watching the movie. Have them learned about the importance of the human eyes? Do they know the complex construction of the eyes?
5. Collect feedbacks and then make modification to improve the animation.
6. Evaluate final critiques and recommendations and then make modification to improve the animation.

## Implications

My thesis will bring the folloing benefits:

1. Let people know the important role that eyes play in the human body.
2. Let people know the eye's complex construction.
3. Help people raise the awareness to protect the eyes and give their eyes some rest.

## Softwares

After Effects, Audition, Illustrator, InDesign, Photoshop, AutoDesk Maya

# Implementation Strategies

<b>Format</b>	3D Animation, Modeling Design
<b>Duration</b>	1 Min
<b>Software</b>	Adobe Acrobat Professional, After Effects, Audition, Illustrator, InDesign, Photoshop, AutoDesk Maya
<b>Deliverables</b>	<p>The final design object will be a 3D promotion animation. It has 1 min duration time. This thesis aims to raise awareness of the importance to give the eyes some rest.</p> <p>The research includes education design, illustration design, 3D animation design, 3D modeling design and eyes construction information design as related to students.</p>

# Dissemination

This thesis will exhibit in the RIT University gallery as partial fulfillment of the MFA. The School of Design and Wallace Library Archives will keep it on file for future research.

The thesis will take the form of an article that will submit for publication in magazines such as Communication Arts, HOW, Print and Wired magazines.

The thesis defense will reformat as a presentation for conferences such as Imagine RIT, TEDx, and show my movie in some TV programs like ABC.

The thesis will submit to competitions such as AIGA (Re)designAwards, AmericanAdvertising Federation ADDY Awards, Communication Arts Advertising Competition, HOW Magazines Interactive Design Awards and Print Magazines Print in Motion.

# Evaluation Plan

A questionnaire will be integrated into the final installation. Viewers who are exposed to the thesis, installation will be asked a series of questions to determine the effectiveness and resonance.

1. Do people know the important role that eyes play in the human body?
2. Do people know the eye's complex construction?
3. Does it help people raise the awareness to protect the eyes and give their eyes some rest.
4. Do they like the style of using low-poly animation?
5. Do they feel like it is easier for them to understand the importance of the eyes with vocal interpretation in the background.

The intended outcome of the questionnaire will hopefully decide whether the audiences know the reason why the eyes would get worse though watching my movie. And I want to know if they have been aware of the structure of the eyes through my movie.

# Pragmatic Considerations

The budget will be the reference that I need to have a trip to the specific place to take photos, and to buy the textures that shown online, so that I can use the pro textures to model the better objects.

Also maybe I need to buy some tutorials when I meet the technical problems. And I need the budget to apply to the worldwide competition.

Finally maybe I need the phone cost to make interview with target audiences and take movie from the models.

# Timeline

## Milestones

___ Proposal accepted	Fall Week 10
___ Story Scripts of animation	Winter Week 1 – Winter Week 3
___ 3D Animation started	Winter Week 1
___ 1st committee meeting	Winter Week 3
___ Content of underwater finalized	Winter Week 4
___ Storyboards done	Winter Week 5
___ 2nd committee meeting	Winter Week 6
___ On Land animation done	Winter Week 9
___ 3rd committee meeting	Winter Week 10
___ Pass thesis defense	Winter Week 10
___ Destruction of the surround environment animation done	Spring Week 3
___ 4th committee meeting	Spring Week 4
___ Complete the Soul's Speaker	Spring Week 7
___ Thesis report online	Spring Week 7
___ Last committee meeting	Spring Week 8
___ Thesis show	Spring Week 10
___ Graduation	



# Bibliography

**Design: Models of Change**

*by Ken Baynes*

**Computer Visualization for the Theatre : 3D Modelling for Designers**

*by Christine A. White, Gavin Carver*

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